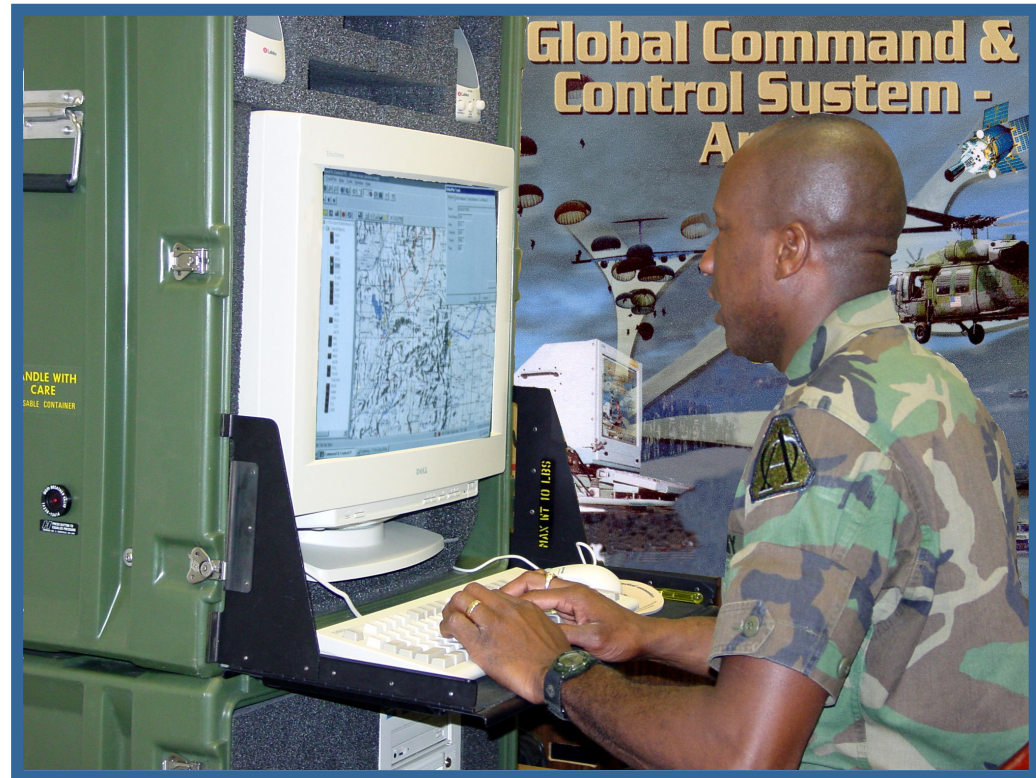




GLOBAL COMMAND & CONTROL SYSTEM - ARMY THEATER SYSTEM



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GCCS-A THEATER LEVEL

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WHO

EUCOM
USAREUR
EUSA
USFK
USARPAC
USARSO
BCDs (1ST, 2ND, 4TH,
KOREA)
USARCENT
FORSCOM
CORPS (I, III, V, XVIII)
USASOC
SCHOOLS

WHAT

MAPPING AND OVERLAY
COMBATANT'S FORCE
ANALYZER
MOVEMENT PLANNING &
EXECUTION
FRIENDLY UNIT INFORMATION
FRIENDLY UNIT EMPLOYMENT
ENEMY UNIT STATUS
TARGETING
INTELLIGENCE
STANDARD REFERENCE DATA
FOREIGN LANGUAGE SERVICES
EXTERNAL TRANSACTION
MANAGER
DATABASE
ADMIN/MGMT/SERVICES

EXTERNAL

JOINT
ARMY

GCCS
EXT I/F
SECURITY
COE
GOTS/COT



DELIVERY 3

• Delivery 3

- Declared System of Record (SOR) in US Army Europe (USAREUR) 30 November
- Additional Fieldings: Army Central (ARCENT) (Forward and Rear), Command and General Staff College (CGSC), I Corps, III Corps, V Corps, XVIII ABN Corps, 10 MTN DIV, Korea (Partial), GCCS-A Training Site (GATS), School of Information Technology (SIT), Battle Labs and Communications Electronics Command (CECOM) Labs
- 10 Engineering Releases to Central Technical Support Facility (CTSF) to support Digital Readiness Brigade (DRB), Millennium Challenge (MC)02, and Maneuver Control System (MCS) Initial Operations Test and Evaluation (IOT&E)
 - › Joint Common Database (JCDB) Changes
 - › Dataload discrepancies from CTSF (bogus units, non-standardization)
- Seven Delivery 3.2.5 Releases fielded

• Delivery 3 to Korea (US Forces Korea (USFK) and Eighth Army)

- Command request for early fielding
- Leaned forward to plan prior to funding receipt
- Funding received, command requirement to commence prior to Ulchi Focus Lens (UFL)
- Partial install (75+ workstations) prior to UFL



DELIVERY 3 (CONT'D)

- **MCS-Light Beta Interface**
 - **Worked with CECOM RDEC to document configurations for interface**
 - **Installed MCS-Light Beta at Lockheed Martin Mission Systems (LMMS) for continued support**
- **D3.2.5.1 p5 released 30 AUG 02**
 - **Security fixes for accreditation for worldwide fielding**



CURRENT STATUS

- **Improvements for Deployable Suites**
 - **Concept of Operations (CONOPS)**
 - **Flexibility**
 - **Improved installation procedures (Last Review Challenge-Systems needs to be better documented in support of Corps/Battlefield Coordination Detachments (BCDs) (aka Deployables/2 X 5))**
- **Additional LMMS Personnel Added (Eliminate Single Points of Failure)**
 - **Tech Editors (Documentation)**
 - **Database**
 - **Test**
 - **External Transaction Manager (ETM)**
 - **System Engineer**
- **Incorporated Lessons Learned from Exercise Support and Users Conference into development cycle**
 - **System Change Requests for Maintenance Releases**



FUTURE MAINTENANCE ACTIVITIES

- **D3.2.5.1 p6 for formal release OCT 02**
 - **Data Migration/Data Sync**
 - **Hangul Applications**
 - **Working with DISA - New C2G for Korea (New Rule Set)**
- **D3.2.5.1 p7 - Load Automation Enhancements, NOV 02**
- **D3.2.5.1 p8 - APR 02**
 - **May contain GCCS Integrated Imagery and Intelligence (I3) and C2PC 5.9 if integration testing is satisfactory**
 - **Presently being defined by Technical Configuration Control Board**



THEATER IMPROVEMENTS

- Continue Blue Force Tracking Efforts
- Move to thinner client and web-based
- Support GC C2 Light efforts
- Partner with GCCS-M and GCCS-AF (reuse)
- Technical Conferences
 - System Administrators
 - Database Administrators
 - Priority Problems and Enhancements
- Users Conferences (JAN 02)
- Training Conferences (NOV 02)
- Continue documentation improvements
- Continue to simplify installation procedures
- Continue to work Joint Common Database issues (Several unresolved issues)
- Improve ability to load data for exercises, training, real world activities



Block IV

• Block IV

- Complete Delivery Definition
 - › Delayed while resolving D3 issues, ECP 16, ECP 17
- Prototyping
 - › Extensible Information System (XIS) over Integrated C4I System Foundation (ICSF) Client for 4.1
 - › WEBCOP (Navy)
- Block IV when fielded is Supportable and Interoperable with GCCS and ABCS. (Must be sustained in the field for 3-5 years)
- Build GCCS-A segments on top of GCCS Joint and COE 4.6/4.7
- Server Infrastructure
 - Port to Integrated C4I System Framework (ICSF), 4.x (e.g., CST)
 - Solaris 8 server (4.x kernel, APM, etc.)
 - Informix 9.3
- System Administration
 - Improve load automation
 - Provide for degraded mode operations - disconnected ops then resync
 - › Command and Control Personal Computer (C2PC), Movement Planning and Execution (MPEX)
 - Improve System Administration capabilities. (Tools, ease of use, flexibility, other items based Technical Conference, Sep 02)



BLOCK IV (CONT'D)

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- **Transition workstations to WIN2K**
 - **Mission Applications reengineered as appropriate (Could merge enemy and friendly application into a “units” application)**
 - **Evaluation of current and future CONOPS, outstanding System Change Requests and User desired enhancements**
 - **Active Display Services (ADS)**
- **C2PC 5.9 and multiple injectors**
- **GCCS Integrated Imagery and Intelligence (I3) (via C2PC 5.9 Injector)**
- **Integration of ABCS Foundation Products into GCCS-A Baseline**
 - **Integration of Common Message Processor (CMP) Data Injection capability ('Prototype' via the CMP that's integrated with C2PC 5.9.)**
 - **C2R may be required for CMP operations**
 - **Defense Message System (DMS) client integration (may be done in support of Delivery 3)**
 - **Investigation of Common Tactical Picture's) (CTP) data transfer capabilities**
 - **CMP manual message injection (on Win2K (or XP) workstation)**
 - **Integration of Defense Collaboration Tool Set (DCTS), which includes Combined Arms Planning and Execution System (CAPES)**
 - **TOC Boot Client (TBC) as required on workstations (and server) for operation with other members of ABCS TOC LAN**



BLOCK IV (CONT'D)

- **Extensible Information System (XIS) over ICSF Client for 4.1**
 - This will occur in parallel with the C2PC 5.9 incorporation effort
 - 4.1 could be fielded instead of 4.0 if there's delay in fielding of 4.0
- **WEBCOP (NAVY VERSION) as a prototype**
 - May be able to run GCCS-A's XIS apps in the WebCOP because Navy WebCOP uses XIS
- **Evaluate requirement for Tactical Interface Server (TIS)**
- **Incorporation of GOTS Software Segments and Products (Includes Corcen Single Log-on)**
- **Integrate Microsoft Office into baseline (Including Internet Explorer 5.5 and Outlook)**
- **Upgrade GOTS and COTS products (Includes MCS Light Products)**
- **Modify current interfaces**



BLOCK IV (CONT'D)

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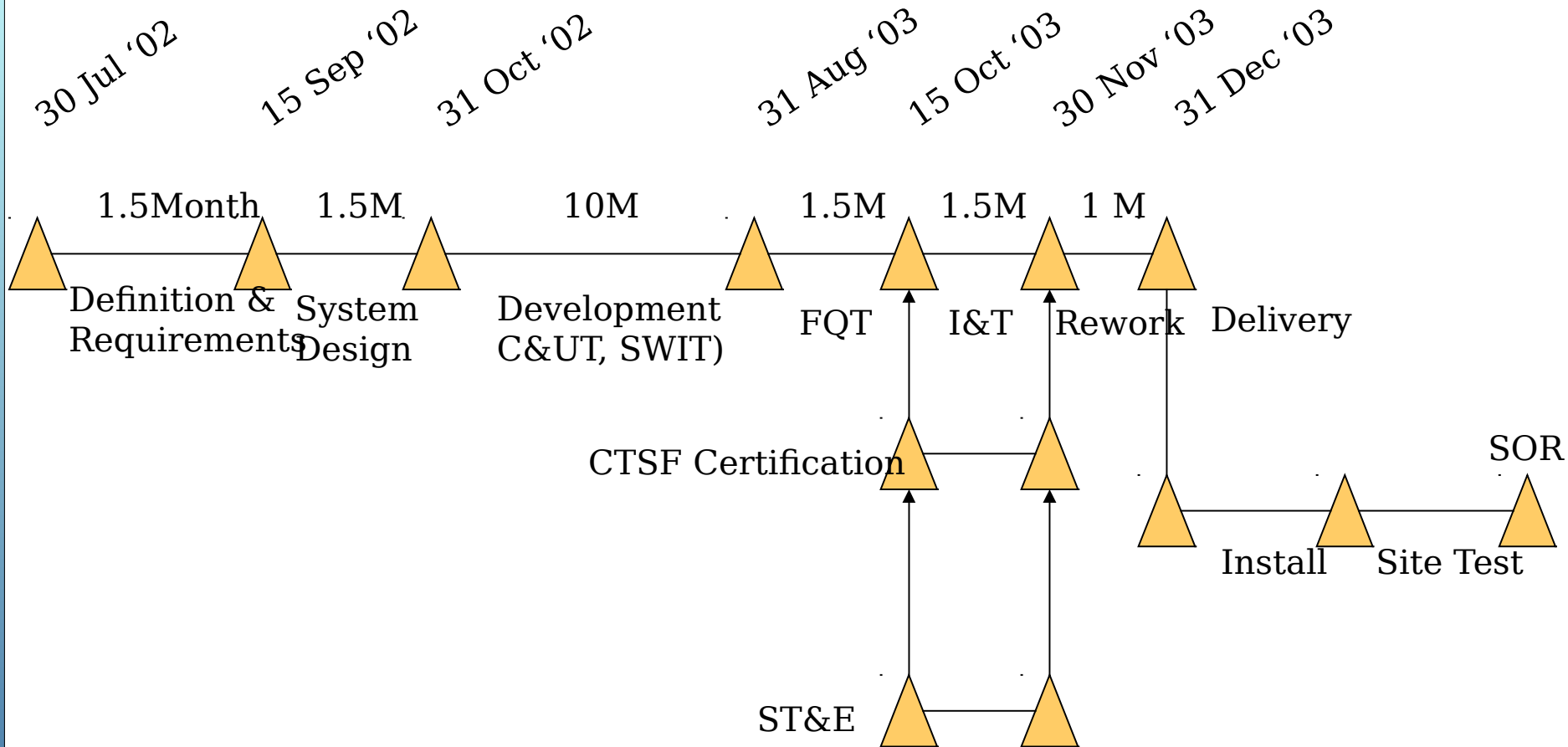
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- **Blue Force Tracking (BFT) - Balkan Digitization Initiative (BDI) and Gulf Digitization Initiative (GDI)**
- **Integrated Imagery and Intelligence (I3) (GCCS Joint Segments)**
- **Additional Interfaces (subject to funding, schedule constraints, and user prioritization)**
 - **Overlay exchange between CTP and GCCS-A (C2PC), and between C2PC and the GCCS COP**
 - **Extensible Markup Language (XML)**
 - **Warfighters Simulation 2000 (WARSIM)**
 - **Joint (Warfighters) Simulation (JSIMS)**
 - **Joint Warning and Reporting Network (JWARN)**
 - **Global Transportation Network (GTN)**
 - **Air and Missile Defense Work Station (AMDWS) and other Army Battle Command System (ABCS)**
 - **Transportation Coordinators Automated Information for Movements System (TC AIMS) II**
 - **Joint Intelligence, Surveillance & Reconnaissance (JISR)**
 - **Joint Force Requirements Generator (JFRG) II**
 - **Aviation (Army Airborne Command & Control Systems (A2C2S), Patriot, Tactical Airspace Integration System (TAIS))**
 - **Global Decision Support System (GDSS)**



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BLOCK IV NOTIONAL SCHEDULE

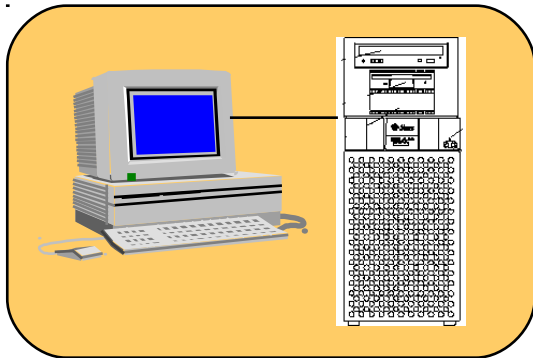




MIGRATION TO SMALLER DEPLOYABLE PLATFORMS

Original Corps Platforms

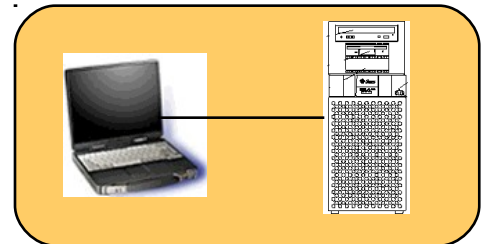
- Servers: 4 Sun Sparc 20s
- NT Workstations: 10 Desktop NTs
- 36 Transit Cases
- 4720 lbs



DEL3.2
ABCS 6.x

New Corps Platforms

- Servers: 4 Ultra 10s
- NT Workstations: 10 Panasonic CF-71 laptops
- 20 Transit Cases
- 2844 lbs (40% reduction)





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**BACKUP
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COMMAND AND CONTROL PERSONAL COMPUTER (C2PC)

Provided by USMC



AGEND A

- **Overall C4I context for C2PC**
- **C2PC Information**
 - **Definition/Background**
 - **COP Display/Distribution**
 - **Mapping Capability**
 - **Injectors**
 - **Communications**
 - **3rd Party Development Support**
 - **C2PC 5.8 Enhancements**
 - **C2PC 5.9 Enhancements**
 - **Beyond C2PC 5.9.0**
- **Related Efforts**
 - **MCS/TCO (C2PC) Interface**
 - **FIOP Tactical COE Workstation**



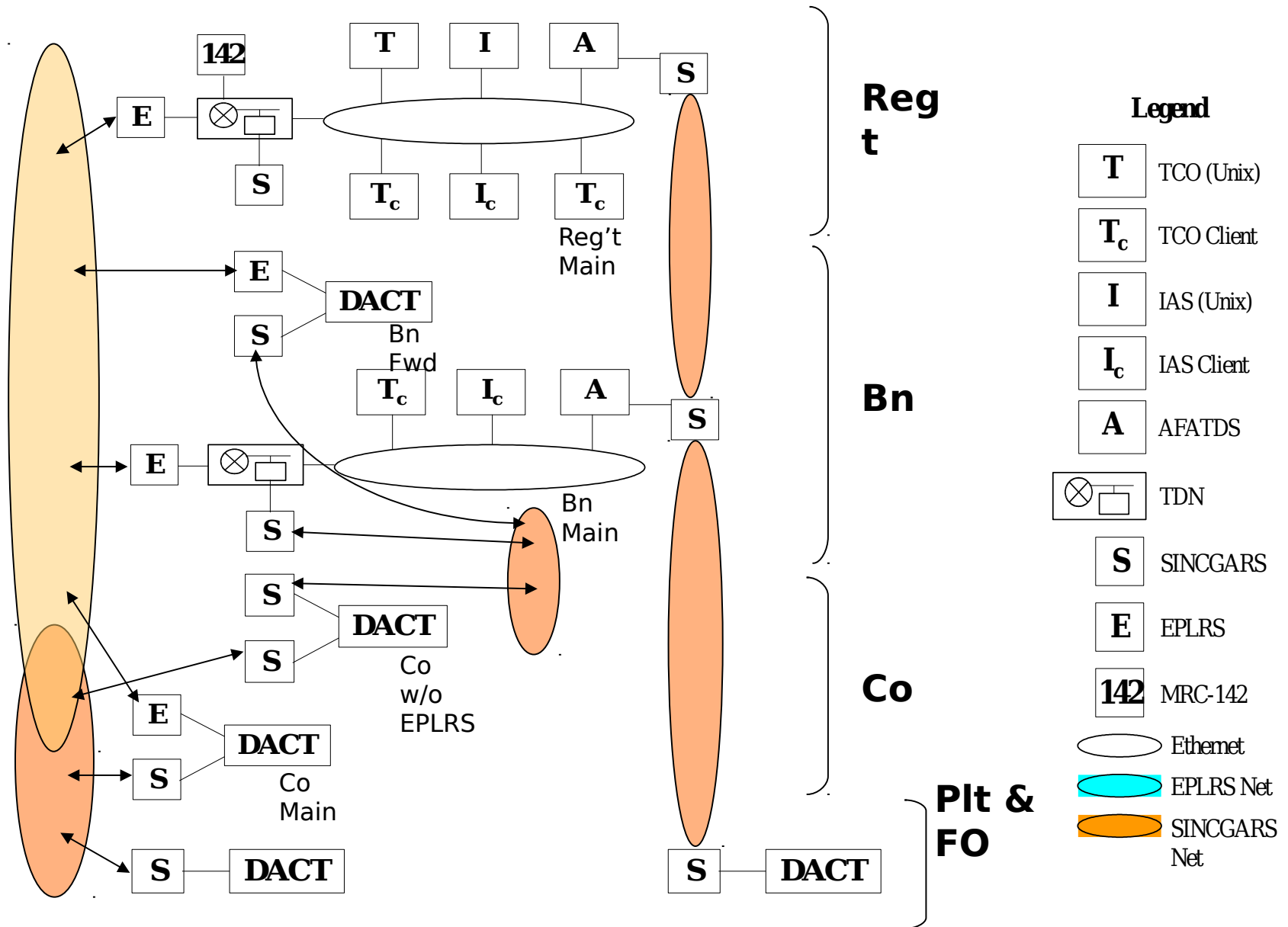
OVERALL C4I CONTEXT FOR C2PC CURRENT ARCHITECTURE AND ISSUES

- **Low Bandwidth (4.8-56Kbps) Combat Net Radio (CNR) with islands of high bandwidth LAN's (COC's)**
- **Must be able to operate in an unreliable communications environment**
- **Must be able to operate with Navy Shipboard LAN-based systems, as well as Army ground systems over radio, possibly simultaneously. Radio approx. 1/1000 the bandwidth of a LAN**
- **Mix of WinNT clients (C2PC and other apps) and Unix systems (GCCS, GCCS-M, and TBMCS)**
- **Current emphasis has been on hierarchical information distribution, centered on Unix servers located at higher echelons**
- **Systems must continue to operate when disconnected from other systems in the information chain**
- **Several msg. standards available for use (OTH-Gold, VMF, USMTF, TADIL J, etc). Services use different formats, often for similar information**



NEAR-TERM SYSTEMS ARCHITECTURE FOR GCE REGIMENT AND BELOW

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TARGET ARCHITECTURE (STARTING FY03)

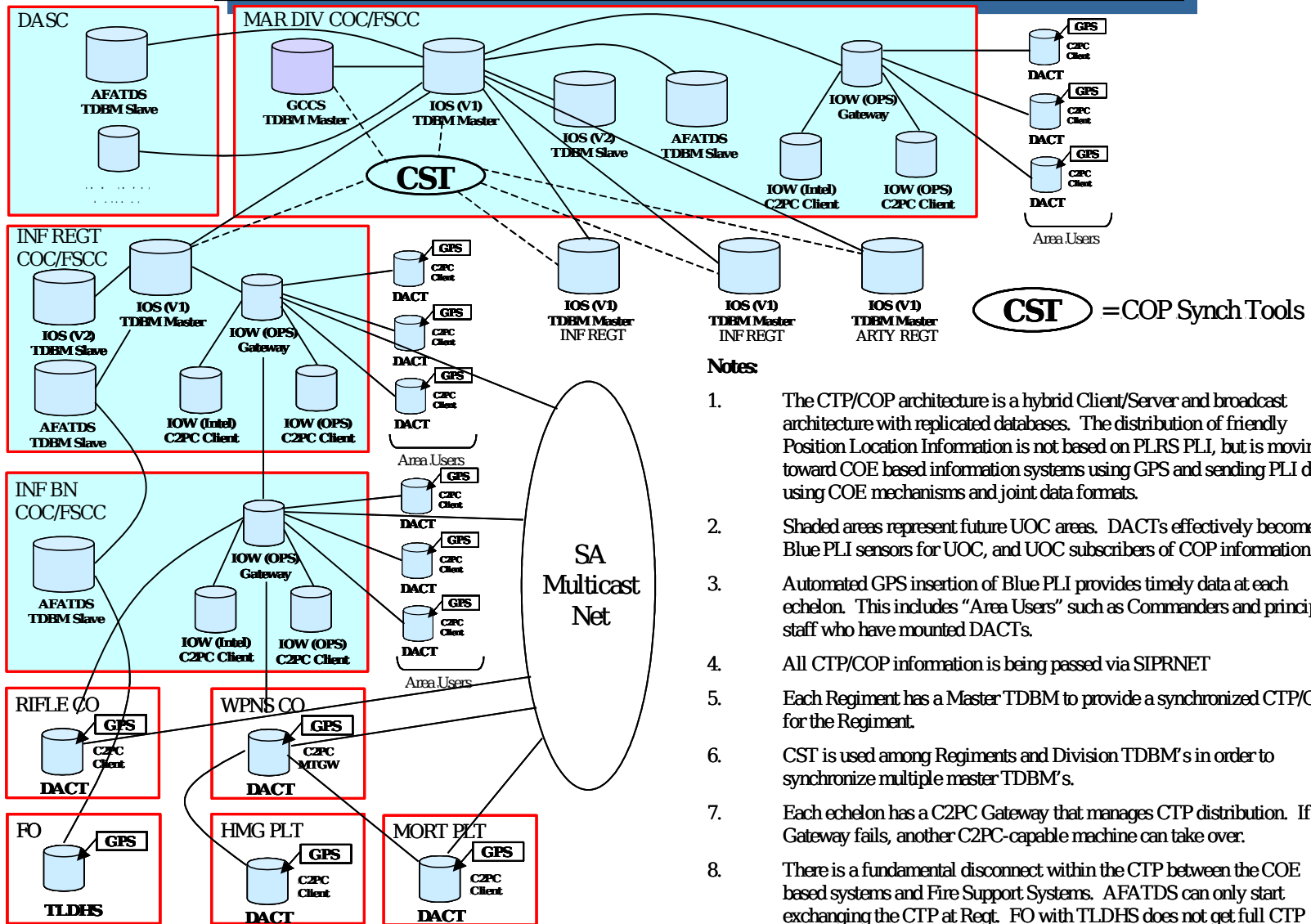
- **Hybrid COP/Broadcast information distribution**
- **“INC-less” architecture. EPLRS 10.3 enhanced to support IP forwarding, SA agent, broadcast/ multicast**
 - **Comm mechanism transparent to info systems!**
 - **Almost self organizing, self healing**
 - **Very efficient bandwidth utilization**
- **Focus away from Unix servers for Situational Awareness. NT systems become means for systems interoperability**
- **Use of JTA approved message standards for passing SA data**



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TARGET ARCHITECTURE - CTP/COP



Notes:

1. The CTP/COP architecture is a hybrid Client/Server and broadcast architecture with replicated databases. The distribution of friendly Position Location Information is not based on PLRS PLI, but is moving toward COE based information systems using GPS and sending PLI data using COE mechanisms and joint data formats.
2. Shaded areas represent future UOC areas. DACT's effectively become Blue PLI sensors for UOC, and UOC subscribers of COP information.
3. Automated GPS insertion of Blue PLI provides timely data at each echelon. This includes "Area Users" such as Commanders and principle staff who have mounted DACT's.
4. All CTP/COP information is being passed via SIPRNET
5. Each Regiment has a Master TDBM to provide a synchronized CTP/COP for the Regiment.
6. CST is used among Regiments and Division TDBM's in order to synchronize multiple master TDBM's.
7. Each echelon has a C2PC Gateway that manages CTP distribution. If a Gateway fails, another C2PC-capable machine can take over.
8. There is a fundamental disconnect within the CTP between the COE based systems and Fire Support Systems. AFATDS can only start exchanging the CTP at Regt. FO with TLDHS does not get full CTP through AFATDS, and there are two points of failure.

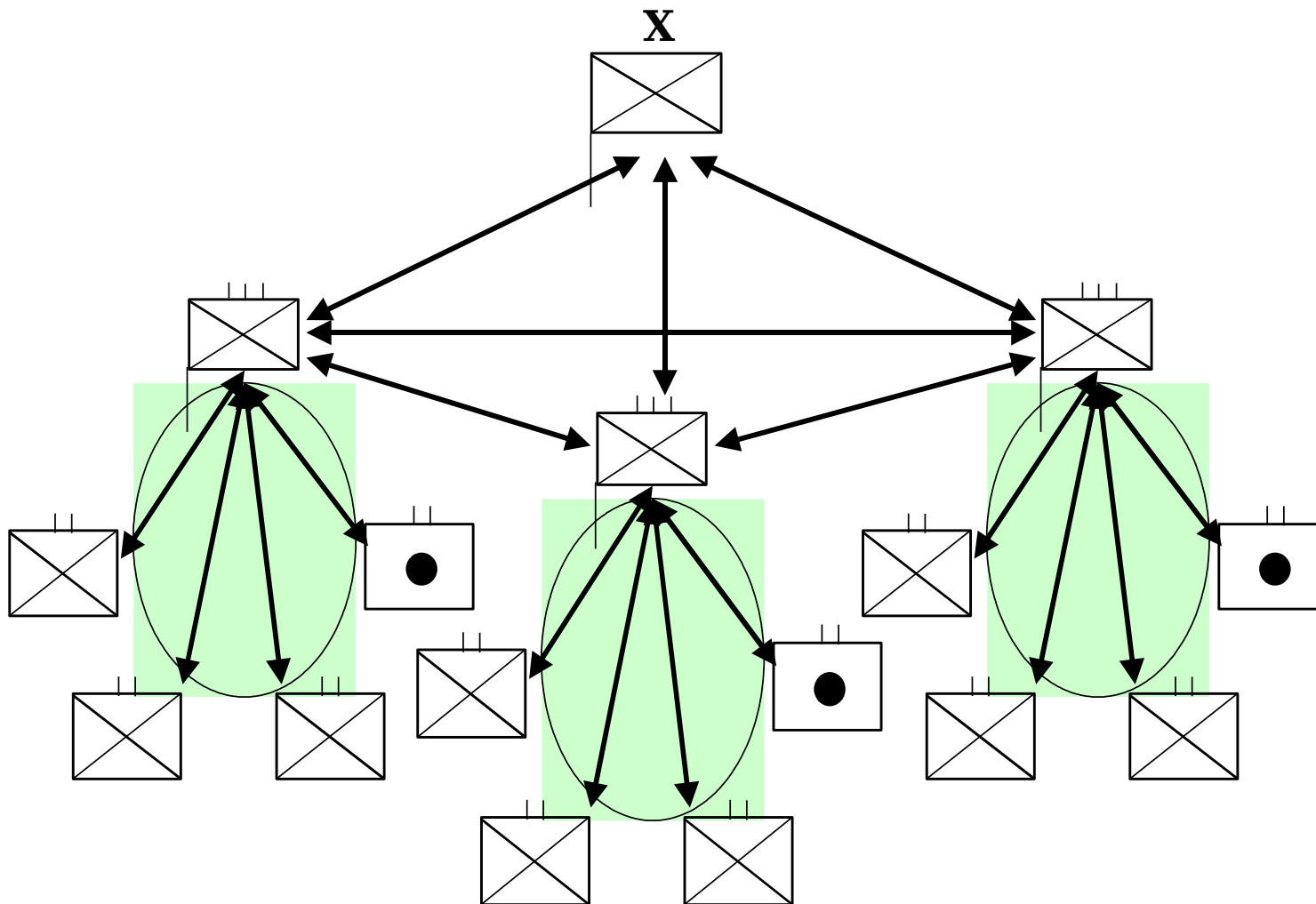


TARGET ARCHITECTURE (CONT'D)

- **EPLRS 10.x Needed**
- **Transition vehicle for JTRS**
 - **Basis for future enhancements (e.g. 288 Kbps radios, Quality of Service, etc.)**
 - **Keep network functioning when no TDN available**
 - **Vastly decrease network planning (eases operations, task organization, planning)**
 - **Efficient Comm - Broadcast/multicast of SA**
- **Available late 2002**



EPLRS GENERAL COMM ARCHITECTURE





TARGET ARCHITECTURE (CONT'D)

- **EPLRS 10.x required C2PC modifications to realize potential**
 - **Data subscription/Track filtering between echelons**
 - **VMF PosRep for broadcast/multicast track updates. Increases USMC/Army interoperability**
 - **Manual/adjustable resync to reduce network loading**
 - **Update bundling in CNR environment**
 - **IP multicast**
 - **Disconnected operations (Unit/Platform Track correlation below Regiment)**
- **These changes being incorporated into C2PC 5.9**
- **The C2PC modifications increase information exchange efficiency by over a factor of 10 for SA distribution and enable autonomous operations below Regiment level**



C2PC DEFINED

- **Command and Control PC (C2PC) is a Windows (98/ME/NT/2K) application**
 - **Exchanges tactical data with GCCS based data server and other C2PC-based systems**
 - **Via serial port, LAN, tactical radio, etc.**
- **Provides a complete geographically based situational awareness capability that includes display of the GCCS Common Operational Picture (COP) data**
- **Is not a system itself, but rather an application deployed by USMC on the IOW, DACT, and AAV; and as a DISA GCCS client mission support application**
- **C2PC dynamically combines data received via various communications interfaces on a multiple map or imagery display for analysis by native or 3rd party decision aids**



C2PC DEFINED

- **The C2PC COP/CTP display normally consists of tracks/unit positions as independently updated entities, graphic overlays, routes, and tactical messages (opnotes/free text/VMF/USMTF)**
- **Being designed to work in the Regiment and below environment**
 - **Low-bandwidth**
 - **Intermittent communications**
 - **Disconnected Operations**
 - **Combat Net Radio (SINCGARS, HF) and EPLRS**
 - **Joint Operations with Army, Navy, JTF, etc**



C2PC BACKGROUND

- **Started as an INRI (NGIT) internal research and development project in late 1994**
- **Demonstrated at JWID 1995**
- **Marine Corps vision that all MAGTF C4I operators would sit in front of Windows-based PCs, not UNIX workstations**
 - **Training and familiarity with Windows-based PCs**
 - **Lower cost**
- **Marines fielded C2PC beginning in NOV 98**
- **DACT fielding in FY02-03**
- **AAAV plans to field C2PC in both the P and C variants (06-07?)**
- **Adopted/Adapted by numerous USMC intelligence programs**

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C2PC VERSIONS

- **Current releases (as of MAR 2001)**
 - **DISA 5.5.7 (9 MAY 00)**
 - **USMC 5.6.3 (31 MAR 00)**
 - **C2PC 5.8.2 (Spring 2002)**
 - › **Combines baselines (DISA & USMC)**
- **Planned future releases**
 - **C2PC 5.9.0 (1st Qtr 2003)**
 - › **Current development**
 - » **Tactical communications enhancements**
 - » **Print to scale, Shape, DTED II**
 - » **Tactical graphics (MIL-STD 2525B)**



PLANNED C2PC 5.9.1 FEATURES

- **Track Management**
 - **COE 4.x Gateway/Client Support (all track types, overlays)**
 - **Unit Injector to TMS promotion**
 - **Track Hierarchy**
 - **Data Unit Aggregation for Display**
- **Visualization**
 - **Increased MIL-STD-2525B Tactical Graphics Support**
 - **Moving/Rotating Map**
- **Communications**
 - **Integrated and Populated Marine Corps Address Book**
 - **Improved MIL-STD-2045-47001B Support**
 - **Improved System Behaviors for VMF Messages**
 - **Improved TacComm Viewer and Messaging Alerts**
- **New Injectors**
 - **JCDB Injector (FIOP)**
 - **Core Terrain Analysis Injector (DSTB)**



PLANNED C2PC 5.9.1 FEATURES (CONT'D)

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- **Coordinated fielding of C2PC Injectors**
 - Intel Office (MIDB access)
 - Improved DSTB (Decision Support Toolbox) Injector
 - Improved Overlays Injector
 - Target Injector
 - FS Client
 - SPEED (Comms planning)
 - TRSS (Tactical Remote Sensor System)
 - Improved TBMD Injector
- **Improved Developer Support**
 - Alerts SDK
 - Address Book SDK
 - Improved Comms SDK
 - Overlay SDK
 - Routes SDK
 - Trackplot SDK



PLANNED C2PC 5.9.2 FEATURES

- **TRACK MANAGEMENT**

- Data Linking to Tracks from Injectors (Maneuver/Intel/FS exchange)
- Support for New Tracks

- **Visualization**

- Commercial JMTK (CJMTK) Support

- **Communications**

- MIL-STD-2045-47001C Support
- VMF Reissue 5 Support, in coordination with AFATDS
- MIL-STD-188-220C Support

- **Coordinated Development/Fielding of C2PC Injectors**

- THS Injector
- JWARN Injector
- Targeting Injector (JTT/AFATDS/MIDB exchange of targeting data)

- **Improved FS Client for AFATDS V7**



ORGANIZATIONS USING C2PC

- **USSOCCOM**
- **USCENTCOM**
- **USEURCOM**
- **USPACOM**
- **USSOCOM**
- **NORAD-USSPACECOM**
- **Joint Battle Center**
- **USACOM J2961 JTASC**
- **Air Combat Command**
- **Air Mobility Command**
- **Most Navy Ships**
- **USCG**
- **USFK**
- **HQPACAF**
- **AFSOC**
- **USASOC**
- **PACFLT-Hawaii**
- **AFSOC**
- **USSTRATCOM**
- **CENTAF**
- **Joint Inter-Agency Task Force East**
- **XVIII Airborne Corps**
- **I Corps**
- **V Corps**



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C2PC KEY POC'S

- **Contact Info:**

- **Randy Ream**
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- **(703) 784-0842**

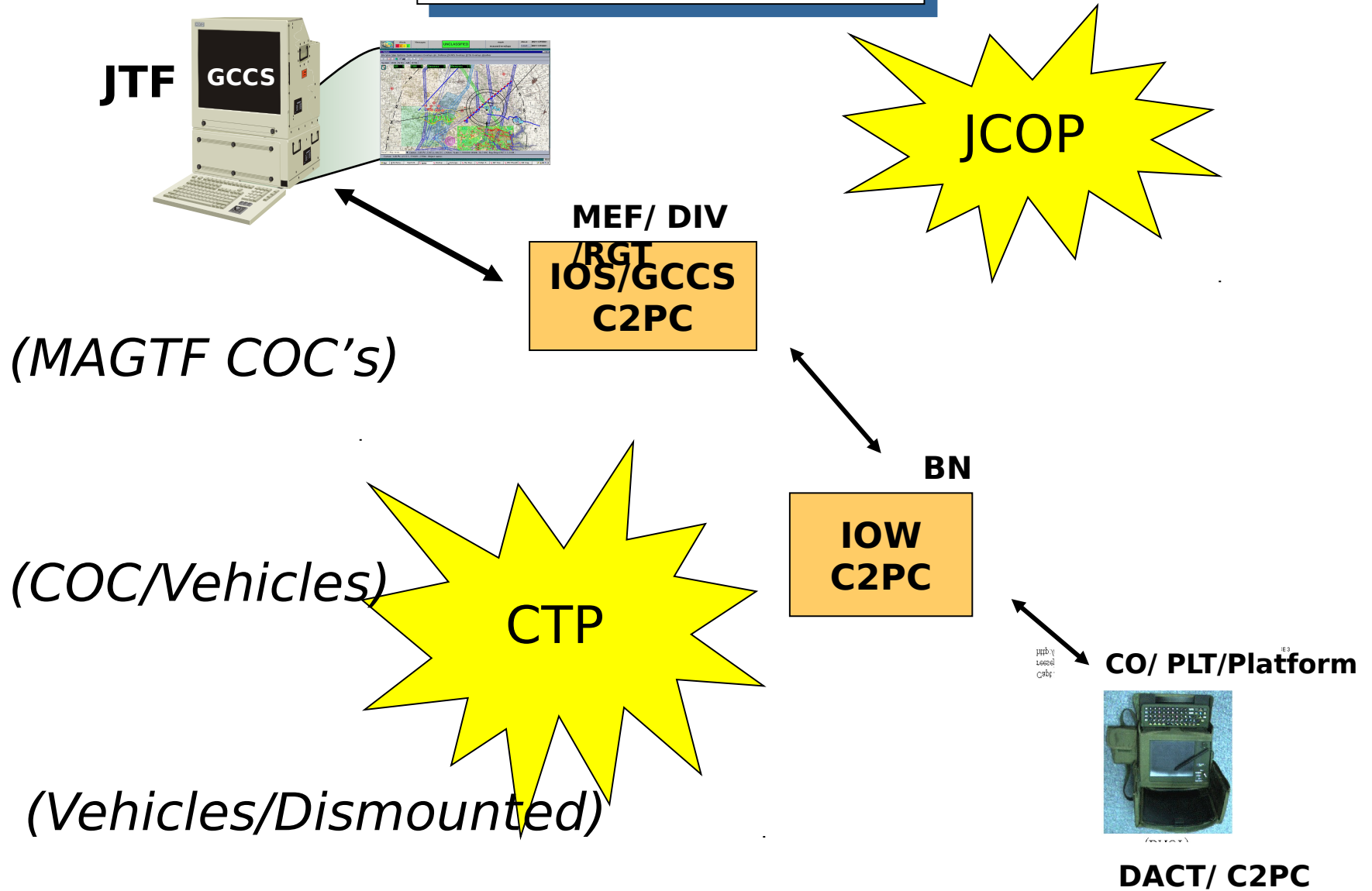
- **Ed Constantine**
- **C2PC/C2CE Program Manager**
- **econstantine@northropgrumman.com**
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- **Claudia Eccles**
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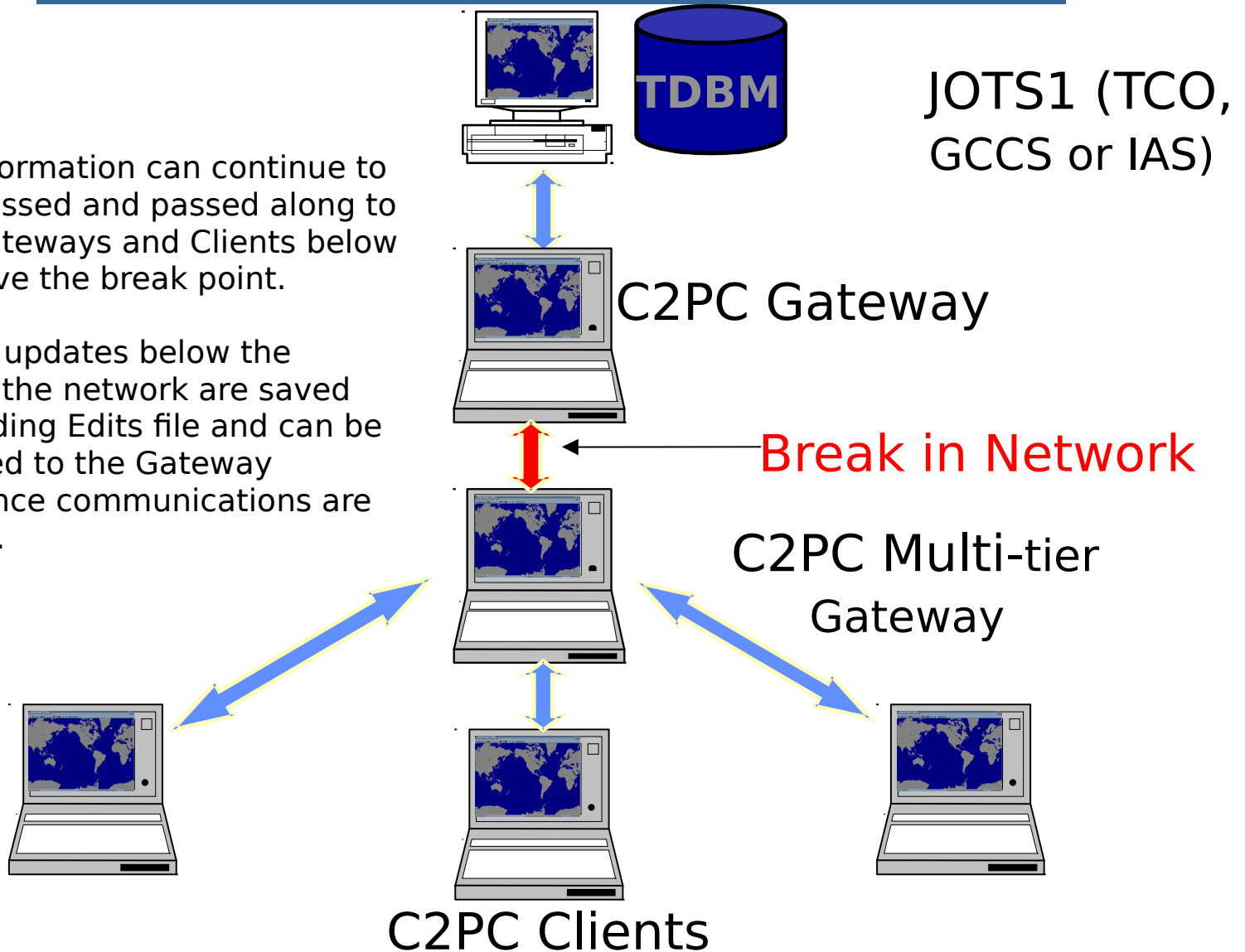
COP DISTRIBUTION





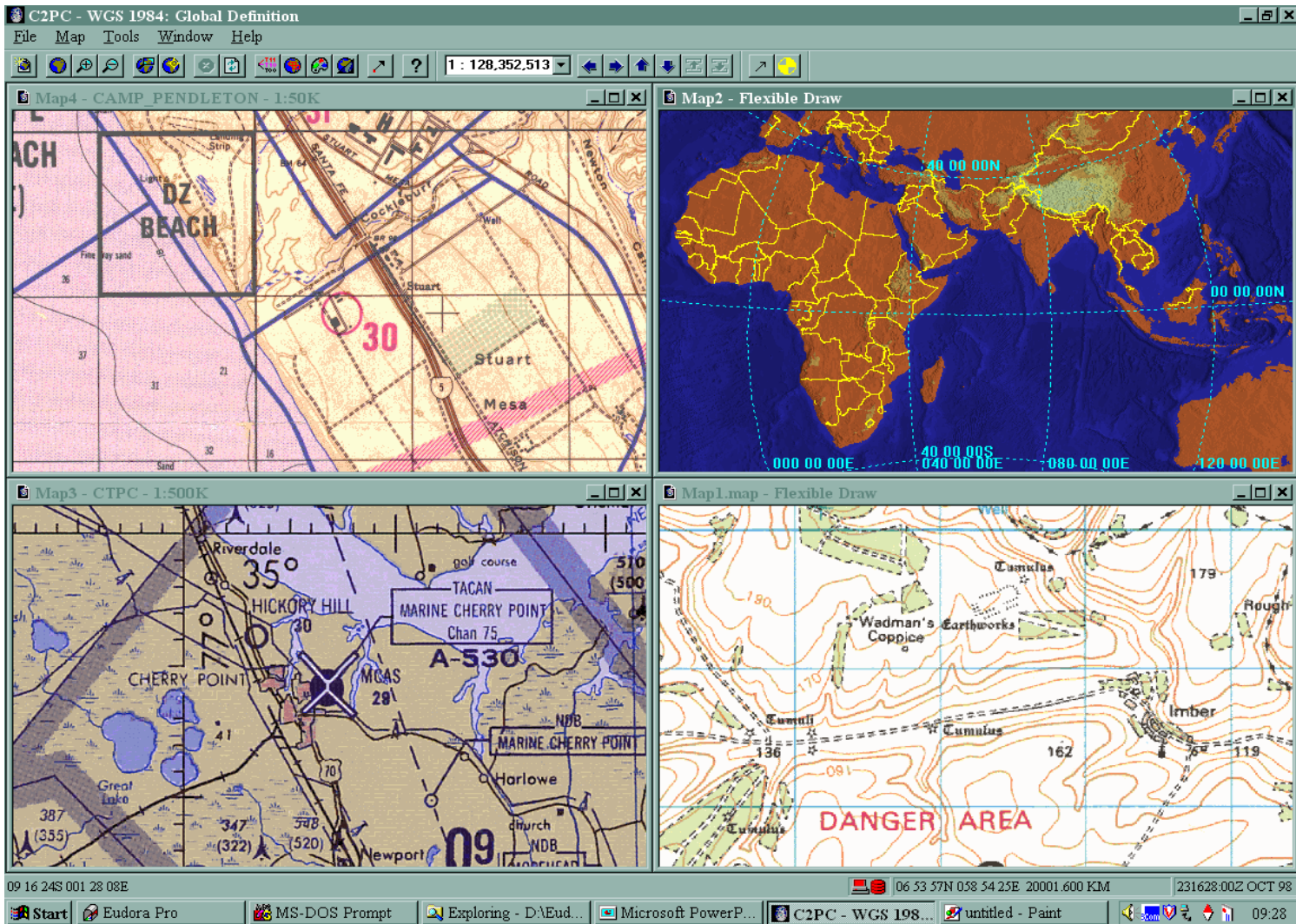
MULTI-TIERED GATEWAY DATA FLOW

- Track information can continue to be processed and passed along to other Gateways and Clients below and above the break point.
- All track updates below the break in the network are saved in a Pending Edits file and can be submitted to the Gateway above once communications are restored.





C2PC MAPPING





C2PC MAPPING

- **Multiple map windows can be displayed on the screen at once**
- **Each map window can be set to display a different area of interest, various digital map or imagery products, and various filtered views of the track database**
- **Software Development Toolkit (SDK) for cartographic support**



C2PC MAPPING

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- **Support for the following map data formats (C2PC 5.8.2):**
 - **RPF: CADRG, CIB**
 - **VPF: LWD, DNC, VMAP, DTOP**
 - **ADRG**
 - **DTED I**
 - **NOAA vector and raster (BSB)**
 - **WVS, WDB I, WDB II**
 - **ETOP**
 - **NITF**
 - **GeoTIFF**
- **Future formats (C2PC 5.9.0 - delivery JUN 02):**
 - **DTED II**
 - **Shape files**



C2PC MAPPING

- **Projection support - Mercator, Transverse Mercator, Cylindrical Equidistant, Polar Stereographic, Polyconic**
- **Datum Support - over 200 datums included**
- **Full zoom-in, zoom-out, pan, variable intensity, re-center, zoom box, and declutter capabilities**
- **Range/bearing tool**
- **Dynamic range tracer**
- **Sites database**
- **Map Browsing capability**
- **Print to Scale (5.9.0)**



C2PC INJECTORS

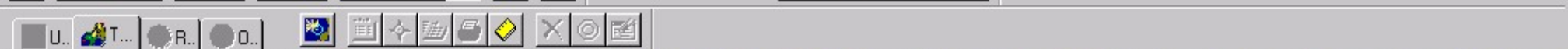
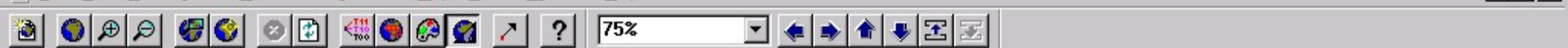
- Injectors are like COE “segments” in that they can provide mission specific functionality but leverage the resources of C2PC via SDK APIs/interfaces
- C2PC has the following native internal injectors: Overlays, Routes, Trackplot, TBMD, Formations, Units & Targets and VMF (C2PC 5.9)
- C2PC Injectors get their own tree view tab to the left of the map to organize their objects and typically manage their own objects on the map for events, injector specific data, and property pages
 - C2PC mapping engine (Atlas SDK) plots the objects for the injector on any/all of the map windows
 - With the TMS SDK injectors can also create their own tracks



C2PC TRACKPLOT

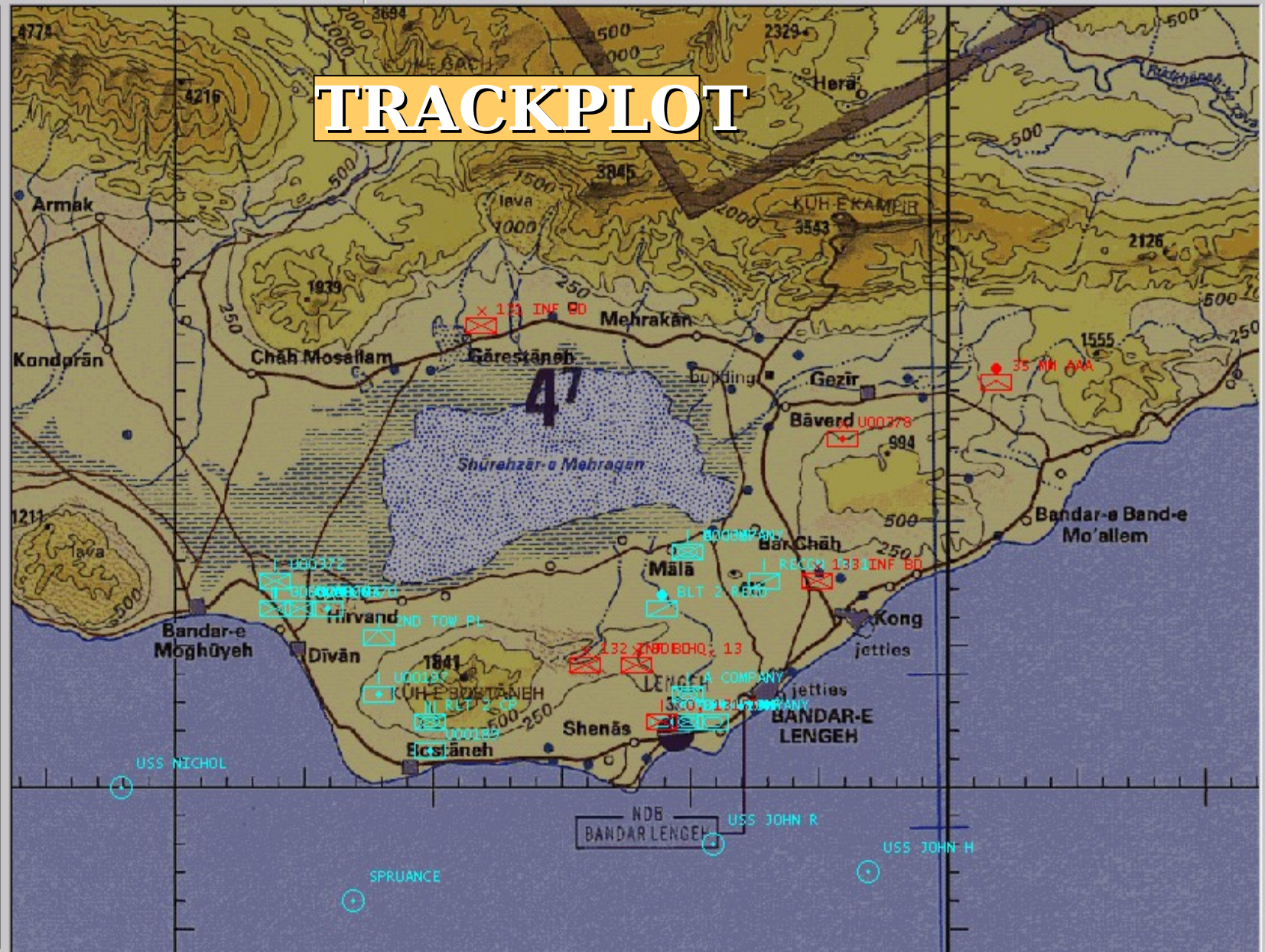
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- **Track database add, edit, and delete**
- **Many plot options are available to determine which tracks display in the map window. Tracks can be toggled on/off according to threat status, track category, echelon level, track type, and time-late**
 - **Boolean track attribute filtering**
- **Supports MIL-2525 and NTDS symbology**
- **Track subscription and filtering before transmission (C2PC 5.9)**
 - **Track types and attributes**
 - **Geographic filters**
- **Undo for track deletes**



- c:\h\data\local\c2pcs
- Platforms
- Units
 - 1 BN 103 S
 - 1 MAR BDE
 - 103 SSM BD
 - 104 AVIAT
 - 109 ARMOR
 - 11 FTR GRP
 - 111 ARMOR
 - 112 ARMOR
 - 121 INF BD
 - 122 INF BD
 - 123 INF BD
 - 13 TKR GRP
 - 131 INF BD
 - 132 INF BD
 - 133 INF BD
 - 15TH MEU S
 - 1ST BN COM
 - 291 INF BD
 - 293 INF BD
 - 294 INF BD
 - 2ND TOW PL
 - 3 BN2ND MA
 - 35 MM AAA
 - 3RD MAW FW
 - A COMPANY
 - A COMPANY
 - A COMPANY
 - B COMPANY
 - BDE HQ, 13
 - BLT 2 RECO
 - C COMPANY
 - C COMPANY
 - CO, 131ST
 - DET, MAG 1

TRACKPLOT





C2PC OVERLAYS INJECTOR

- Ability to create polylines, circles, rectangles, arrows, etc. that are geo-registered on the map
- Import / Export with GCCS
- Can transmit to other peer C2PC applications
- Supports MIL-2525B and NTDS symbology
- Undo / Redo for user actions
- Can convert overlay to different formats
 - .MGC files for GCCS/IOS systems
 - VMF K05.17 Overlay for Army MCS (C2PC 5.9)
- Can insert MS objects and documents
 - URL's
 - Office documents (Word, Excel, PowerPoint)
 - Files (Imagery, etc.)

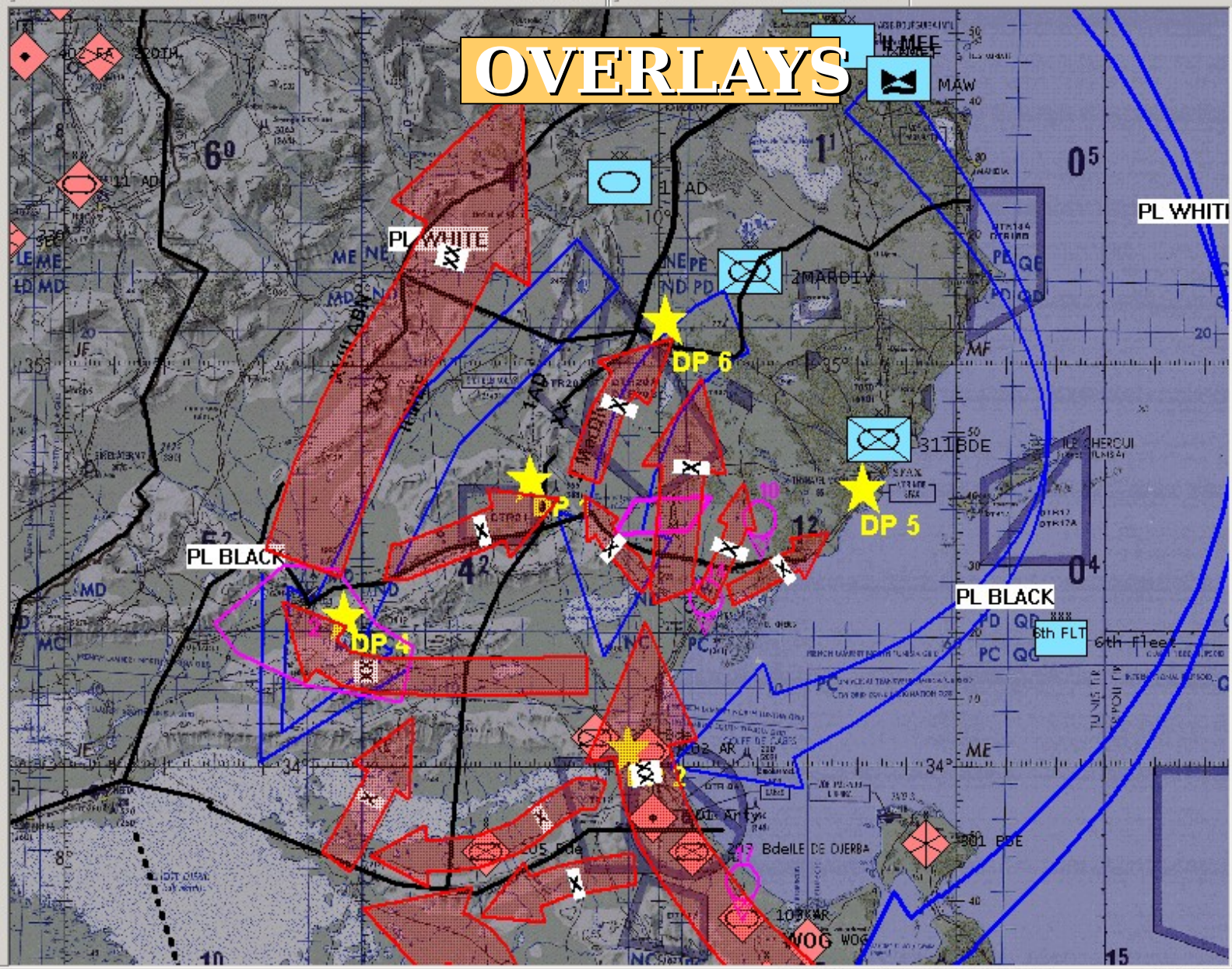
TrackPlot

Overlays

Routes Units

Overlays

- GOWP 2000
- NAI TP
- 22 Jul Ints
- 22 Jul Ints
- AA
- Blue Start
- COA 1, St
- COA 1, St
- COA 1, St
- COA 1, St
- COA 2, B I
- COA 2, St
- COA 2, St
- COA 2, St
- COA 2, St
- COA 2, St
- COA 2, St
- COA 3, St
- COA 3, St
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- COO (2) (2
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- MCOO (2)
- Misratah A
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- Nafa (2)



Map navigation and tool icons.



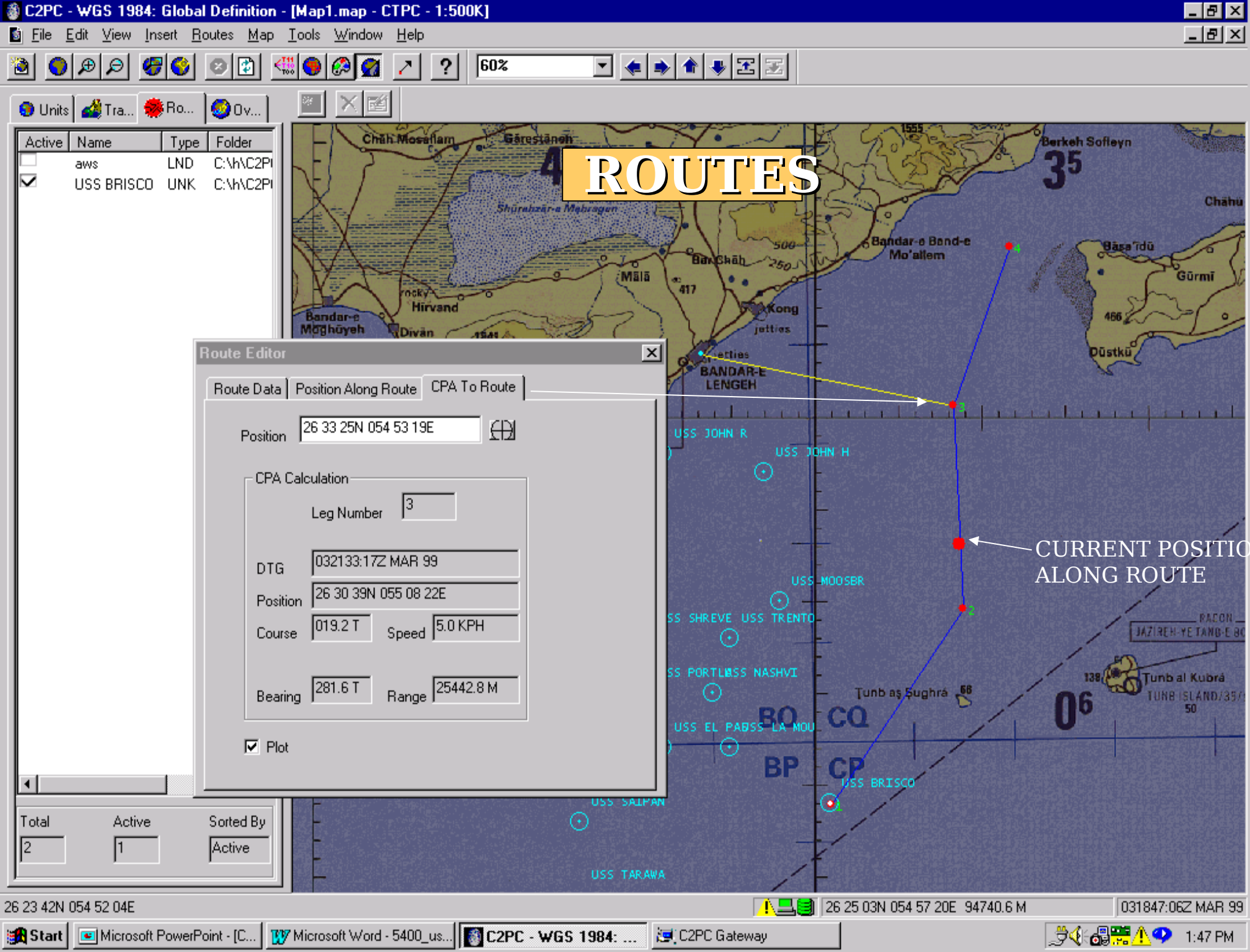
C2PC ROUTES

- **Transmit to other C2PC boxes.**
- **Undo / Redo for user actions.**
- **Ability to calculate the CPA from a track to a route.**

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C2PC UNITS & TARGETS INJECTOR

- **Future planning for units and targets independent of live track data**
- **Supports MIL-2525B and NTDS symbology**
- **Undo / Redo for user actions**
- **Requirement to generate a live track/unit database from planned positions**
 - **Funded. To be delivered post C2PC 5.9**

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Units

☐ 1st Bn, 11th Mar☐ A Btry, 1st Bn, 11th M☐ B Btry, 1st Bn, 11th M☐ C Btry, 1st Bn, 11th M☐ HQ Btry, 1st Bn, 11th☐ 1stBn, 11th Mar☐ I MEF

Targets

☐ AB1001☐ AB1002☐ AB1003☐ AB1004☐ AB1005☐ AB1101☐ AB1102☐ ab1103

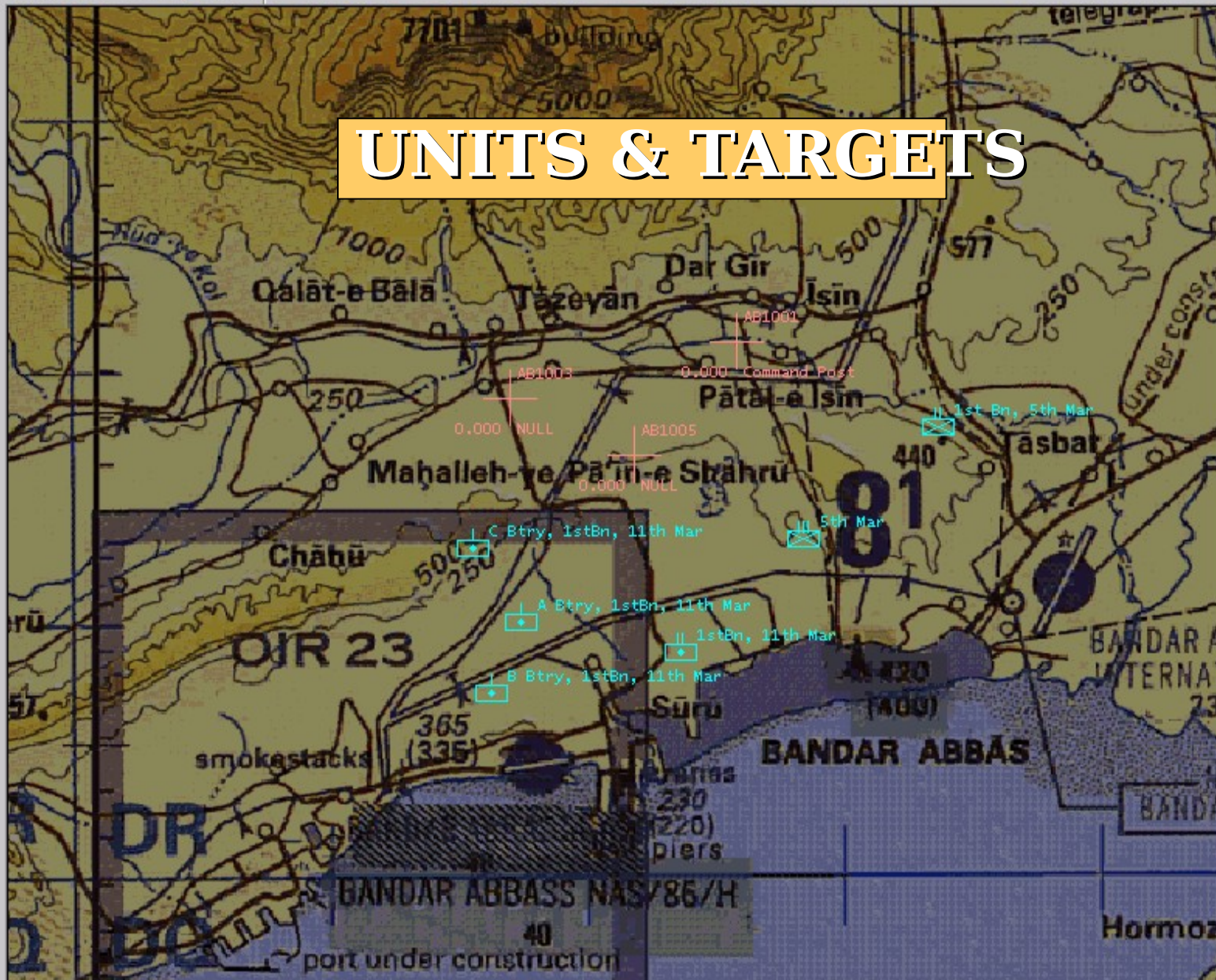
Operations

☒ ANNIHILATE

Targets

☒ AB1001☒ AB1003☒ AB1005

Units

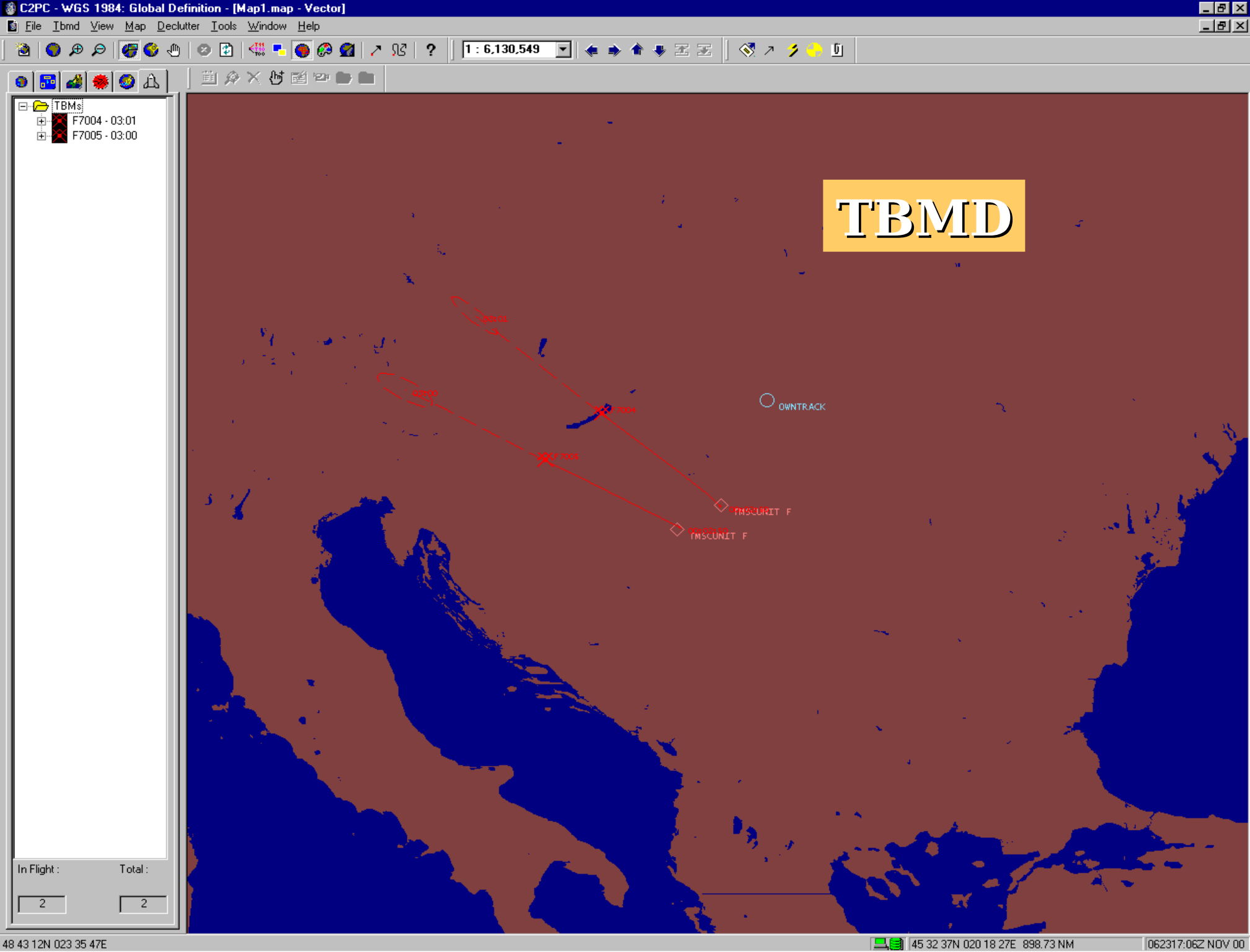
☒ 1st Bn, 5th Mar☒ 1stBn, 11th Mar☒ 5th Mar☒ A Btry, 1stBn, 11☒ B Btry, 1stBn, 11☒ C Btry, 1stBn, 11☐ Bandini



C2PC TBMD INJECTOR

- **Displays projected path and landing area of a TBM**
- **Requires connection to GCCS/GCCS-M server for reception of missile track over tactical receive interfaces**
- **Uses interface to C2PC Alert Server for audible notification**







USMC 3RD PARTY DEVELOPED C2PC INJECTORS

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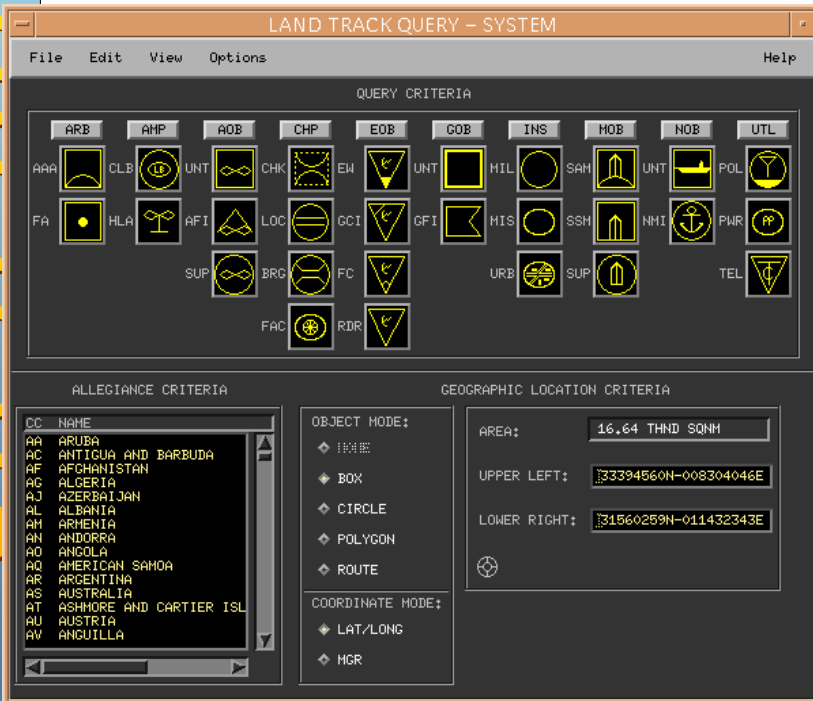
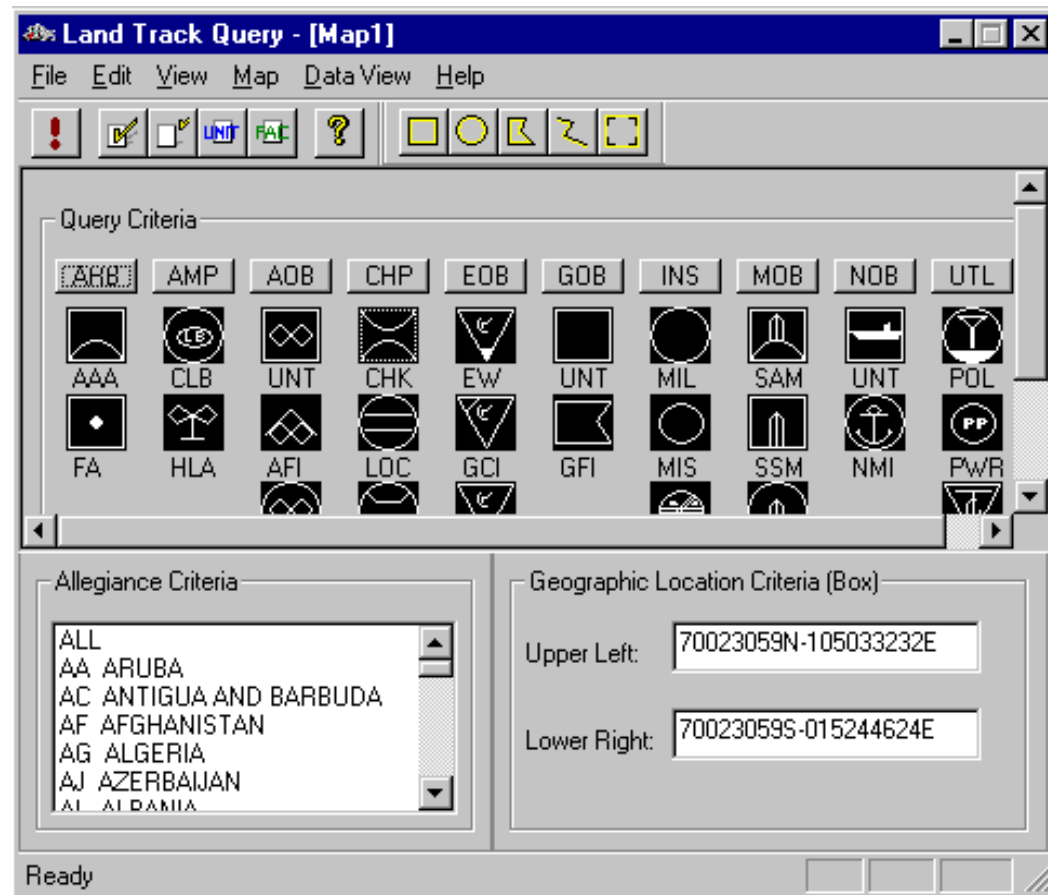
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- **Intel Office - MC**
 - MIDB interface
- **Decision Support Tool Box (DSTB)**
 - IPB/Terrain Analysis
- **Fire Support**
 - AFATDS Client / Fire Support Client (FSC) (under development)
- **Communications**
 - System Planning, Engineering, and Evaluation Device (SPEED) Injector (under development)
- **Logistics**
 - Logistics Command and Control (LC2) Injector (under development)



INTEL OFFICE - MC

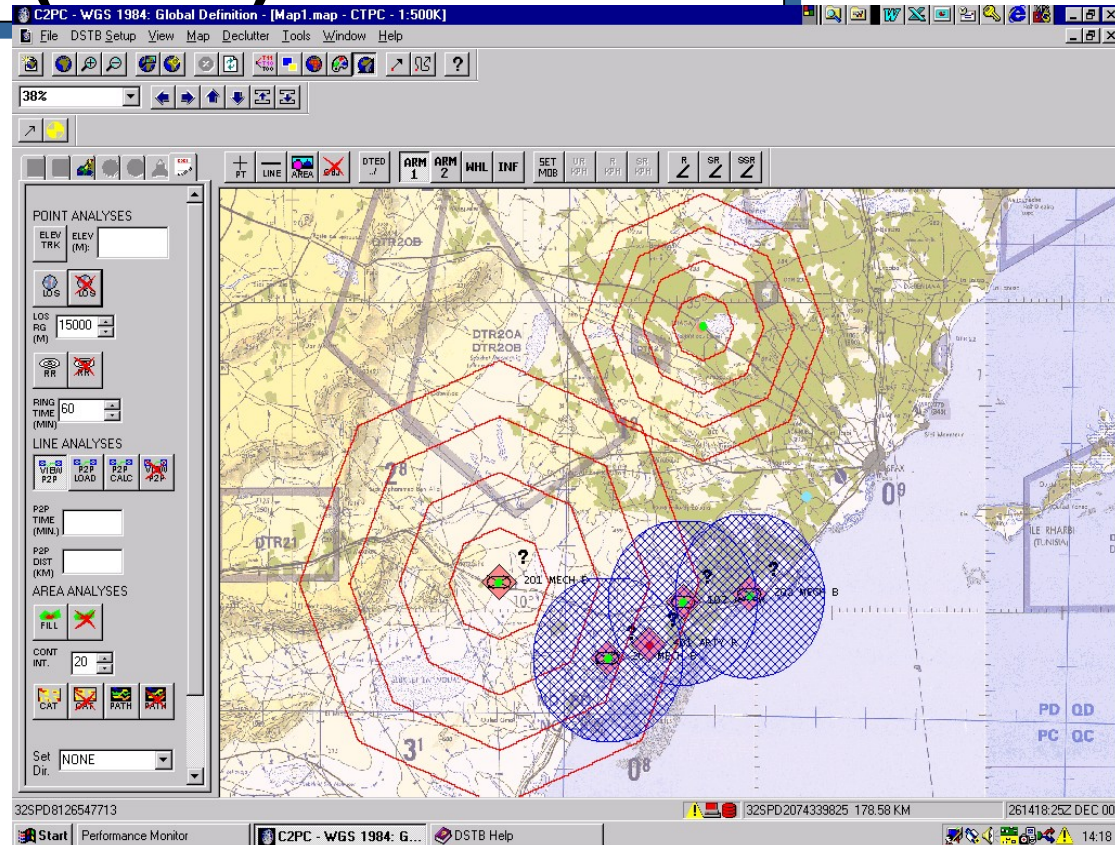
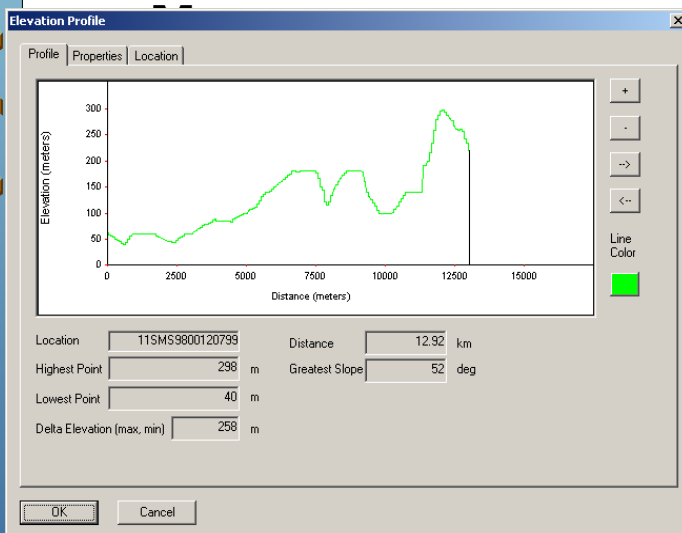
- Access to MIDB data using multiple search options
- Plot the results on your C2PC map
- GCCS-I3 “Look & Feel”





DECISION SUPPORT TOOL BOX (DSTB)

- IPB/Terrain Analysis Tool for C2PC
- Capabilities:
 - Line of Sight analysis
 - Movement Range Ring analysis
 - Terrain Categorization





FIRE SUPPORT INJECTOR

- **To be fielded in Summer 2002**
- **A user-friendly front end to AFATDS**
- **Being developed by Raytheon, this injector makes direct calls to the AFATDS server, and utilizes C2PC as a display and mapping interface**

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OTHER INJECTORS

- **Logistics Command and Control (LC2) Injector**
 - Interfaces with external logistics databases
 - Displays 'logistics status' of displayed tracks
- **System Planning, Engineering, and Evaluation Device (SPEED) Injector**
 - Assists S6 in planning communications layout



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C2PC COMMUNICATIONS

- **TCP/IP networking**
- **Multicast support**
- **Segmentation/Reassembly (S/R UDP)**
- **SINGARS/EPLRS/802.11b**
- **GPS interfaces (NMEA 0183, ICD 153, RHC internal)**
- **Serial port OTH-Gold**
- **VMF TDIP Reissue 4 (CMP ver 4.3)**



3RD PARTY DEVELOPMENT SUPPORT

• Atlas SDK

- Supports independent developers with map injector development support
 - › Current map injectors:
 - › Fire Support Client (Raytheon) interfaces with AFATDS
 - › Intel Client (PRC) interfaces with MIDB
 - › Decision Support Toolkit (USMC) operational terrain analysis
 - › Small Unit Logistics (Sapient) interfaces with UMSC logistics databases
 - › SPEED (Logicon-Orlando) USMC communications analysis software
 - › GCCS-A (Lockheed Martin US Army specific)



3RD PARTY DEVELOPMENT SUPPORT

- **TMS SDK (C2PC 5.8)**

- **Provides a means for 3rd party developers to:**
 - › **Add/Create, Edit, and Delete any Unit, Platform, ELINT, COMINT or Acoustic track**
 - › **Query track data attributes**
 - › **Add or Delete a track report**
 - › **Receive track event notifications**
 - › **Iterate over track database**



C2PC 5.8 FEATURES

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- **Track Correlation**
 - Allows user to merge Platform, Unit, and COMINT tracks on local C2PC display for correlation with COP tracks
- **TMS SDK**
- **Drag & Drop Quick Report**
 - Provides a rapid means to update a track's position
- **Customizable menus and toolbars**
 - Operator can turn menus, toolbars and icons off/on, can move less used menu items to an "Advanced" menu or toolbar, and rearrange menu item order
 - Can save and recall profiles of tailored menus
 - Drag and drop toolbars



C2PC 5.8 FEATURES (CONT'D)

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- **Undo/Redo of a configurable number of actions (0-99) in Overlays, Routes, Units/Targets, and TrackPlot injectors (undo delete tracks only).**
- **Opnote UI enhancements**
- **Tactical Messaging Support**
 - **VMF**
 - **USMTF**
 - **COE Message Processor (CMP)**
 - › **Army Developed for COE**
 - › **Generic User Interfaces (UI) for all messages**
 - › **Supports developers developing unique Uis**
 - › **Has API for use by applications**



C2PC 5.9 ENHANCEMENTS

- **Improved disconnected ops with GW/MTGW turn-around**
- **Overlay enhancements: text labels, MILSTD-2525B tactical graphics**
- **MILSTD-2525B military symbology update**
- **VMF message processing with CMP (MCS-TCO interface)**
- **Multi-cast support (EPLRS 9.X/10.X compatibility)**
- **EPLRS - SINGCARS forwarding of VMF K05.1**
- **Track subscription filters for smart pull of track picture**
- **Communications SDK for 3rd party developer access to C2PC**

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BEYOND C2PC 5.9.0

- **Interface with latest generation GCCS/COE systems (COE 4.x based)**
- **Commercial mapping products (ESRI Shape file format) (Funded)**
- **3-D Mapping (funded)**
- **Enhanced MIL-STD-2525B support**
 - **Tactical Graphics - Lines and Areas (Fire Support, Mobility, etc) (Partially funded)**
 - **MOOTW Symbolology (Funded)**
- **Enhanced VMF messaging and Address Book (Funded)**
- **Dynamic overlay alert capability (planned)**
- **Navigation enhancements for DACT/AAAV (planned)**
 - **Moving Map**



RELATED EFFORTS

- **MCS-TCO (C2PC) Interface**
 - **ASD C3I directed. Overseen by Joint Force Command (JFCOM)**
 - **VMF based interface for horizontal Interoperability between Army and Marine Corps - Bn and Regt/Bde levels**
 - › **Exchange the ground picture and C2 messaging**
 - **8 VMF Messages**
 - › **Free-Text**
 - › **SPOT/SALUTE**
 - › **Basic Weather**
 - › **Position Report**
 - › **NBC-1**
 - › **Threat Warning Message**
 - › **Field Orders**
 - › **Overlays**
 - **JITC certification testing conducted**



RELATED EFFORTS (CONT'D)

- **Family of Interoperable Operating Pictures (FIOP) Tactical COE Workstation**
 - **JROC Initiated. Led by Air Force and DISA**
 - **Three tasks within FIOP**
 - › **Web-based execution management (ADOCS migration to COE - USAF Lead)**
 - › **Tactical COE Workstation (Marine Lead)**
 - › **VMF in the COE (Army Lead)**
 - **Tactical COE Workstation Purpose - Accelerate development of a Tactical COE Workstation that can support the tactical warfighter in a mobile environment.**
 - › **Meant to migrate C2PC 5.9 Functionality into COE**
 - **Current view**
 - › **COE will not be able to be downsized given current time/money/hardware requirements.**
 - › **Will continue with C2PC as basis for Tactical Workstation**
 - **FY02 development**
 - › **C2PC 5.9 with COE 4.x interface**
 - » **Interface with GCCS 4.1 and beyond**
 - » **Interface with other COE 4.x based systems**
 - » **Segmented version of C2PC for COE programs**
 - › **COE Downsizing Analysis - Official determination that COE cannot be downsized to work on DACT hardware, and that C2PC 5.9**